



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

February 16, 1999

Donald E. Vanderkar
Aerojet General Corporation
Box 13222
Sacramento, CA 95813

Subject: Review of the Azusa Irwindale Study Area Site Assessment, Baldwin Park Operable Unit, San Gabriel Basin

Dear Mr. Vanderkar:

In the last year and a half, two rocket-fuel related chemicals (perchlorate and N-Nitrosodimethylamine [NDMA]) have been discovered in groundwater in the Azusa/Baldwin Park area. Both chemicals had been tested for earlier, but the analytical methods in use at the time had much higher reporting limits than now achievable. The impact of the discovery of perchlorate and NDMA has been significant: implementation of the remedy has been delayed and the cost of the cleanup appears likely to increase significantly. To minimize the likelihood of future surprises, we are reviewing the adequacy of the site investigations of all of the Baldwin Park area facilities that used a wide variety of chemicals or carried out a wide variety of operations and processes. Aerojet's Azusa operations meet these criteria, having:

- * mixed solid rocket propellants and tested solid and liquid fuel rocket motors;
- * produced high energy propellant additives and liquid fuel rocket motors;
- * produced rocket and torpedo casings;
- * operated a metals plating laboratory, a photo etching laboratory, a vapor deposition laboratory, and other chemical laboratories;
- * operated machine shops;
- * developed power generation simulation systems;
- * developed, assembled and tested electro-optical sensing devices and infrared sensors;
- * manufactured glass filament wound pressure vessels;
- * manufactured fluorine, "kinitro fluoro ethyl formal," "fluoro dinitro ethanol," and "trivinoxipropanol";
- * conducted plastics research and development;
- * conducted research into semiconductors and assembly and testing of space sensors; and
- * developed shipboard domestic waste disposal systems.

As you know, in about 1991 Aerojet began the "Azusa-Irwindale Study Area" (AISA) site assessment to investigate the nature and extent of subsurface contamination which may have been caused by Aerojet's Azusa operations. Many hundreds of vadose zone soil, subsurface vapor,

surface sediment, and groundwater samples were collected. We have since learned, however, that the analytical methods used in the assessment were not capable of detecting at least two chemicals present onsite at levels of toxicological concern.

We request that Aerojet carry out a review of chemicals used or produced at the Azusa facility, and make recommendations on the need for any additional site assessment activities. Specifically, we request that you:

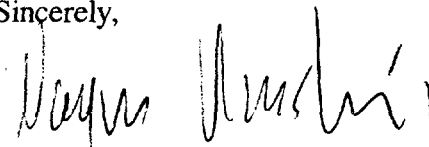
- 1) Prepare a list of all chemicals used or generated at the Aerojet facility (including the Azusa facility and surrounding facilities Aerojet may have leased and operated). List the specific chemicals that may have been used, rather than trade names or general categories.
- 2) Where appropriate, discuss the potential for impurities to be present in the listed chemical (e.g., 1,4-dioxane in solvent), or for the chemical to be transformed by combustion, biological degradation, or other chemical processes (e.g., NDMA produced by combustion of liquid fuels). If known, list potential chemical byproducts or products.
- 3) Indicate whether each chemical listed in steps 1 or 2 has been analyzed for at the Aerojet facility or at downgradient locations. If so, indicate: i) the matrix; ii) approximate timing, number, depth, and location of samples; iii) analytical method used; and iv) the method detection limit (MDL) and/or practical quantitation limit (PQL) achieved.
- 4) For each chemical, indicate a standard or other level of toxicological concern (e.g., MCL, PRG, action level), and indicate the source of the value (e.g., EPA Maximum Contaminant Level). If available, cite levels of toxicological concern in drinking water. If you are unable to locate a level of toxicological concern, please contact me and I will work with the appropriate EPA office to try to obtain any needed values.
- 5) Note those chemicals that *have not* been analyzed for, or have been analyzed for using a method whose reporting limit exceeds the level of toxicological concern.
- 6) Recommend which of the chemicals identified in step 5 should be analyzed for, and provide a brief workplan for their analysis. If you do not recommend analysis of a chemical listed in step 5, provide a clear rationale for not doing so that considers the chemical's mobility, toxicity, and other relevant factors.

To get you started, we have prepared a preliminary list of more than 200 chemicals mentioned in Aerojet 104(e) responses, permits, or other historical documents as used or produced at the site (enclosed). We are conducting or will conduct similar efforts at other facilities that used a wide variety of chemicals or carried out a wide variety of operations and processes.

We appreciate Aerojet's recent commitment to analyze for hydrazine,

monomethylhydrazine, and unsymmetrical dimethylhydrazine in groundwater this month. We would appreciate a brief response to this letter within 14 days indicating whether you intend to comply with our request and complete the evaluation described in this letter. If so, please propose a timetable for preparing and submitting a comprehensive response.

Sincerely,

A handwritten signature in black ink, appearing to read "Wayne Praskins", written in a cursive style.

Wayne Praskins
EPA Project Manager

Enclosure

cc: Arthur Heath, California Regional Water Quality Control Board
Ejigu Soloman, California Regional Water Quality Control Board

**PRELIMINARY LIST OF CHEMICALS USED AT THE AEROJET FACILITY IN
AZUSA, CA**

CHEMICAL	NOTES
1,1-oxybis ethane	
1,1,1-trichloroethane (1,1,1-TCA)	
4-amino-3-methyl-N-ethyl-N-(B-hydroxyethyl)-aniline sulfate	"Kodak Flexicolor" developer
4-amino-N-ethyl-(B-methanesulfonamidoethyl)-m-toluidene Sesquisulfate Monohydrate	"Kodak Color" developer
acetate	
acetic acid	
acetone	
"acid copper stripper (MRN-14)"	
adhesives and putties (assorted)	
alcohols	
alkali metals	
"alkaline resist stripper"	
aluminum powder	
alum	
ammonia	
ammonium hydroxide	
ammonium chloride	
ammonium thiosulfate	
ammonium nitrate	
ammonium perchlorate	
ammonium fluoride	
ammonium bifluoride	
anhydrous ether reagent	
aniline	
arsenic trifluoride	
arsenic	

CHEMICAL	NOTES
arsenic selenide	
arsenic selenite	
"askarel transformer fluid"	
"asphalt, motor oil, and other petroleum-based solid rocket fuel binders"	
"B.N. cleaner"	
benzene	
benzofuran	
bismuth chloride	
black gun powder	
boric acid	
"boron compounds"	
bromines	
butanone	
butyl ethyl ether	
butyl acetate	
cadmium	
cadmium chloride	
cadmium oxide	
calcium carbonate	
carbon tetrachloride	
"caustic solutions"	
"caustic cyanide"	
cesium chloride	
chlorates	
chlorobenzene	
chlorobutane	
chloropropane	
chlorothene	

CHEMICAL	NOTES
chromium, chromic acid, chromic salts	The presence of total chromium and chromium VI should both be evaluated.
cobalt sulfide	
"Commercial Developer DuPont No. 53"	Associated with film processing
"copper solution"	
copper nitrate	
cyanide	
detergents	
di-n-propyl ether	
dibutyl malonate	
dichromic acid	
diesel fuel	
dimethylformamide	
dimethylheptane	
dimethylpentane	
"dinitro fluoro ethyl formal"	
dinitropropylnitraspentanoate	
diphenyl thiocarbazon	
ethane	
ethanol (denatured)	
ether	
ethyldiimine	
ethyl alcohol	
ethyl acetate	
methylbenzene	
ethylene	
"eutectic sodium-potassium alloy"	
"ferlon"	
ferric chloride	

CHEMICAL	NOTES
ferricyanide	
"fluoro dinitro ethanol"	
"forferg 103"	Reportedly a "non-toxic" phosphate chemical
formaldehyde	
formalin	"Kodak Flexicolor"
Freon PCA,	
Freon TA	Reportedly a mixture of Freon TF and acetone.
Freon TE	
Freon TP35	
Freon TCM	
Freon TF	Reportedly the same as Freon 113
freon-21	
fuel oil	
furfuryl alcohol	
gallium disulfide	
gasoline	
glycol ether dowanol "EB"	
"gold solution"	
heptane	
heptene	
hydraulic oil	
hydrazine hydrate	
hydrazine	
hydrobromic acid	
hydrochloric acid	
hydrofluoric acid	
hydrogen peroxide	
hydrogen flouride	

CHEMICAL	NOTES
hydroxylamine sulfate	
"hypo solution"	Associated with film processing
"indium solution"	
iron chloride	
irridite solution	
isobutyl alcohol	
isopropyl alcohol	
JP3	
JP5	
kerosene	
Kodak developing solutions	
lanthanum chips and "plug"	
lead sulfide waste	
lead solution	
lead acetate	
lead sulfate	
lead iodide	
lithium metal batteries	
lithium chloride	
lithium hydroxide	
"Lonco-113"	Reportedly a mixture of 1,1,1-TCA, Freon 113, and isopropanol
magnesium thorium	
mercury	
"Met-L-Check"	Reportedly a mix of "organic acid from coconut oil, isopropyl or butyl alcohol, Shell 140 solvent, and deodorized spray base"
methanol	
methyl heptane	
methyl heptanol	

CHEMICAL	NOTES
methyl ethyl ketone (MEK)	
methyl isobutyl ketone (MIBK)	
methylcyclohexane	
methylcyclohexene	
mineral acids	
motor oil (new and used) and jet engine oil	
n-propyl cyclopentane	
naptha	
naphthalene	
"neutral cleaner (Neutra-68)"	
neutralized bromines	
nickel, nickel solution, nickel sulfate	
nitric acid	
nitrogen tetraoxide	
nitromethane	
oakite	
"Oxy-Prep solution"	
"Oxy-Vate solution"	
paint, pigment, varnish, and thinners (assorted)	
paraffins	
pentanone	
perchloroethylene	
petroleum derivatives ¹	
petroleum ether	
PFG gas	
"platinum solution"	
polychlorinated biphenyls	
polyurethane	

CHEMICAL	NOTES
potassium hydroxide	
potassium ferrocyanide	
potassium perchlorate	
potassium sulfate	
potassium bromide	
potassium hydroquinone monosulfonate	"Kodak First" developer
"print, oscillograph, and kodolith developers"	
propellant grain	
red fuming nitric acid	
"rhodium solution"	
rubber	
selenium	
selenourea	
sodium fluoride	
sodium hydrochlorite	
sodium cyanide	
sodium dichromate	
"sodium azide test motor"	
sodium hydroxide	
sodium hydrochlorate	
sodium sulfite	
sodium sulfide	
sodium carbonate	
Standard Oil "white oil"	
sulfuric acid	
tartaric acid	
tellurium	
tetracetic acid (EDTA)	

CHEMICAL	NOTES
tetrachrome 75	Reportedly one-third chromate and the remainder non-toxic chemicals
Texaco Regal PCR&D oil	
thallium	
thiosulfate	
thiourea	
thorium oxide	
"tin solution"	
toluene	
trichloroethylene (TCE)	
trimethyl hexane	
"Trivinox propanol"	
white fuming nitric acid	
xylene	
xylidene	
yttrium chloride	
zinc	